

Status of Expert Panel Efforts DPR - Potable Reuse

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Panel Co-Chairs**

***January 19, 2016
Advisory Group Meeting***

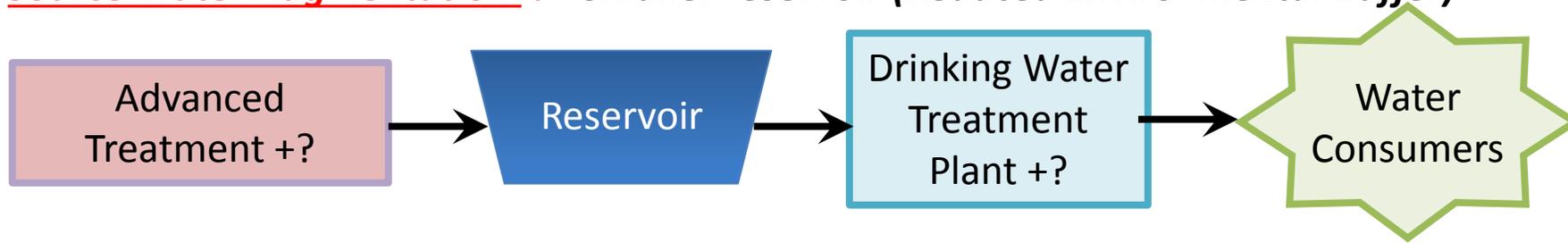
Topics Covered

- ***Overview of DPR Project Configurations***
 - *DPR project illustrations*
 - *Focus on Maintaining Functionality provided by GAP (Reservoir)*
- ***Evaluating Feasibility of DPR Criteria***
 - *Overarching Questions*
 - *Summary of Approach (Briefing Paper)*
 - *Preliminary Findings – Bioassay paper*
 - *Working Assumptions – Reliability paper*
 - *Preliminary EP Schedule & Paper Topics*

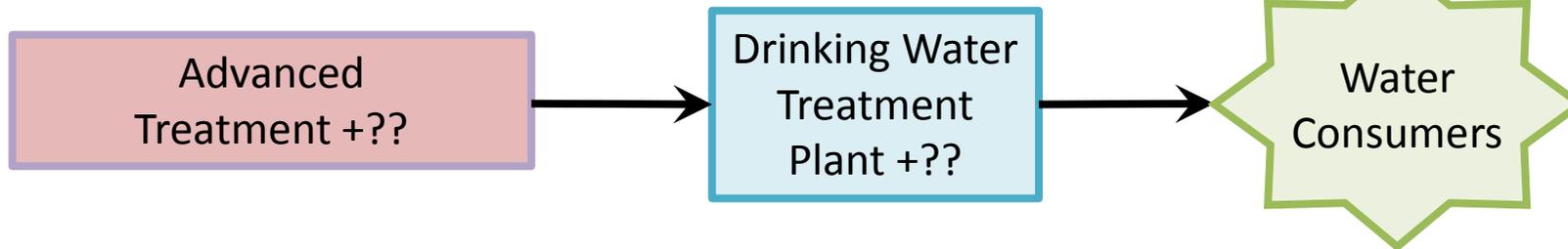
POTABLE REUSE- Configurations

SWA (Reduced Environmental Buffer) and DPR

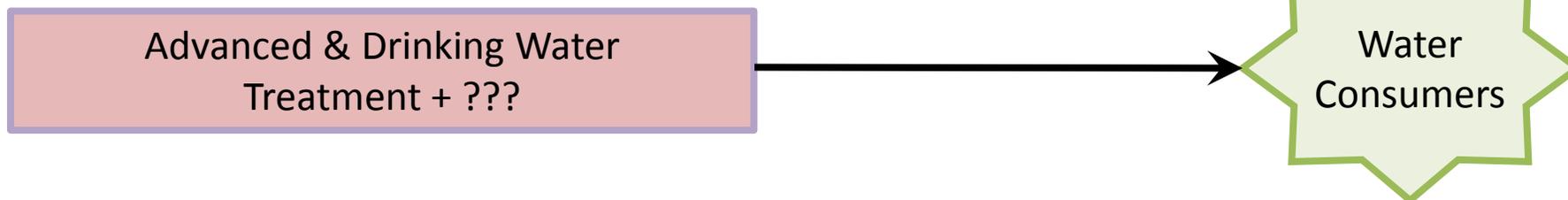
Source Water Augmentation ? – *Smaller reservoir (Reduced Environmental Buffer)*



DPR - Advanced Treated Water as Approved Raw Water Supply

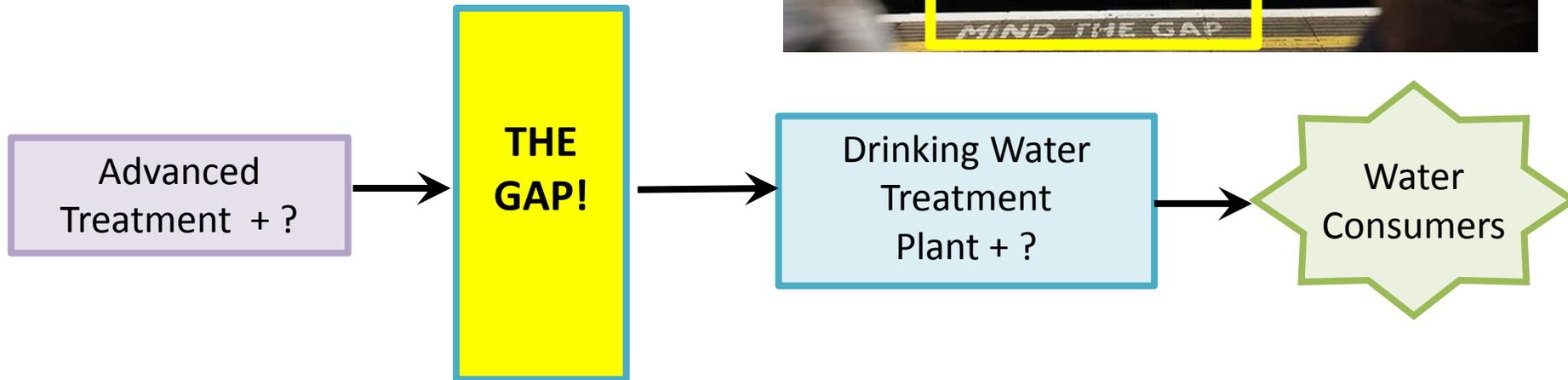


DPR - Advanced Treated Water (ATW) as Approved Finished Drinking Water



Potable Reuse

Maintain Gap Functionality



Treatment of water beyond Advanced Treatment and/or other requirements are needed in DPR to compensate for reduction/loss of the environmental buffer (the “Gap”)

Maintaining the Gap's Functionality

- **Means to maintain positive attributes of environmental buffer (Gap's Function):**
 - **More robust multiple treatment barriers**
 - **Enhanced monitoring for CECs or surrogates**
 - **Real-time or near real-time monitoring capability**
 - **Short term storage of product water to provide time for monitoring results prior to use as a potable supply**
 - **Alternative water supply source and means to quickly respond to off-spec water (time to respond)**

Evaluating DPR Criteria Feasibility

Overarching Questions

- ***Overarching Questions:***
 - **Definition of DPR (continuum) including absence of an environmental buffer.**
 - **The availability and reliability of recycled water treatment technologies.**
 - **Multiple barriers and sequential treatment processes that may be appropriate at wastewater and water treatment facilities.**
 - **Available information on health effects.**
 - **Mechanisms to protect public health from off-spec water.**
 - **Monitoring needed to ensure the protection of public health.**
 - **Other scientific or technical issues that may be necessary, including the need for additional research.**

DPR Briefing Paper Approach and Topics

- **Briefing Paper Scope:**
 - **Issue and background** - (summarize pertinent info)
 - **Recommend practical engineering/monitoring solutions and/or research & Overall Conclusion on Feasibility**
- **Briefing paper topics (Internal Working Drafts):**
 - **Bioassays (Bioanalytical Tools) – nearing completion**
 - **Quantifying Treatment Facility - underway**
 - **Reliability Analytical Methods/Tools – outline**
 - **Molecular and Other Pathogen Monitoring Methods - outline**
 - **Antibiotic Resistant Bacteria (ARB) and Antibiotic Resistant Genes (ARG) in water - underway**
 - **Comparative Health Risks - outline**
 - **Public Health Surveillance - underway**

Bioassay Briefing Paper

Preliminary Findings - Summary

- At present, *in vitro* bioassays of selected biological activities of chemicals in water samples do not perform on an equivalent basis as chemical analyses for specific chemicals with established health effects in monitoring water quality.
- *In vitro* bioassays could play a useful role in directing the identification of chemicals with particular biological activities whose health effects can be subsequently determined.
- A certification process is essential and should be initiated where bioassays are intended for use in monitoring or screening of water and needs to include appropriate interpretation and communication of the bioassay results to regulators and the public.

Bioassay Briefing Paper

Preliminary Findings - Summary

- Several issues were identified: (1) the inadequate evaluation of bioassays for application to complex mixtures with varying composition, and (2) the development of “target values.”
- Despite the absence of “approved adverse outcome pathway(s) (AOPs),” there are existing *in vivo* human and animal data that could be used to develop “target values” for selected bioassays.

Reliability Briefing Paper

Working Assumptions- Summary

- DPR criteria consistent with IPR criteria in the protection of public health.
- Treatment reliability and constituent removal efficiency criteria accepted for IPR relying on reverse osmosis (RO) and advanced oxidation processes (AOPs) are acceptable for DPR.
- Major DPR issue is to define what additional reliability criteria (e.g., treatment and/or monitoring) are needed to replace the functionality of the environmental buffer.
- Main focus is to define the feasibility of DPR criteria from a technical perspective

Tentative Meeting Schedule & DPR Briefing Paper Topics

- Feb 23-24 - Bioassay; Reliability; ARB/ARG
- March 30-31 -Reliability; Chemical & Molecular
(pathogen) monitoring
- April -Monitoring; Reliability
- May (early) -Prelim. Research Recommendations;
Comparative risks
- May (mid) -Draft Panel Report
- June (early) -Draft Panel Report; Public Health
Surveillance
- June (late) -Final Draft Report
- July -Final Draft to SWB DDW staff